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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,977	03/31/2004	Christopher J. Mason	1857.2400000.	5972

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EXAMINER

UNDERWOOD, JARREAS C

ART UNIT PAPER NUMBER

2877

DATE MAILED: 04/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/812,977

Applicant(s)

MASON, CHRISTOPHER J.

Examiner

Jarreas C. Underwood

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☐ Claim(s) \_\_\_\_\_ is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 14, 15 and 23-25 is/are rejected.
- 7) ☒ Claim(s) 9-13 and 16-22 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 31 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>4/2005 and 7/2004</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Specification*

1. The disclosure is objected to because of the following informalities:

Paragraph 0038 makes references to subregion 502a, which does not exist on any figure. The subregion is referred to as 504a as shown on Figure 5.

Appropriate correction is required.

The disclosure is objected to because of the following informalities:

Paragraph 0057 refers to image scanner 902, which does not exist on any figure.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35

U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by

Kochersperger (U.S. Patent Application Publication 2005/0074906).

2. As to claim 1, Kochersperger discloses a maskless lithography system, comprising;

a spatial light modulator (Figure 1, element 104) that includes a plurality of spatial light modulator cells (Figure 5, element 500);

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a reference reticle (Figure 9A, element 902) having at least one reference feature (paragraph 0042), the reference reticle located in a plane with the spatial light modulator proximate to one of the plurality of spatial light modulator cells;

a pattern rasterizer (Figure 1, element 116) that applies a signal to the spatial light modulator to form a die pattern that includes the at least one reference feature (paragraph 0042);

an illumination source (Figure 1, element 102) that emits illumination energy to illuminate the spatial light modulator and the reference reticle; and

projection optics (Figure 1, element 110), having a pupil (paragraph 37), that form a die image with illumination energy entering the pupil from the spatial light modulator and a reference image with illumination energy entering the pupil from the reference reticle (paragraph 0036).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

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4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
3. Claims 2-7, 14, 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kochersperger in view of Lin (U.S. Patent Application Publication 2001/0033996).
4. As to claim 2, Kochersperger discloses everything claimed, as applied above, with the exception of an image scanner that detects the die image and the reference image formed by the projection optics, however to do so is well known as taught by Lin.

Lin discloses an image scanner (Figure 1A, element 20) that detects the die image and the reference image formed by the projection optics. It would have been obvious to one having ordinary skill in the art at the time of invention to include an image scanner to assist the optimizations of focus, dose, Numerical Aperture and partial coherence setting.

5. As to claim 3, Kochersperger in view of Lin discloses everything claimed, as applied to claim 2 above, however Kochersperger is silent with respect to stating the die image and the reference image are resist images.

Lin discloses a method of a dynamic mask exposure system (paragraph 0012), which is well known in the art to produce a resist image.

6. As to claim 4, Kochersperger in view of Lin discloses everything claimed, as applied to claim 2 above, however Kochersperger is silent with respect to stating the die image and the reference image are aerial images.

Lin teaches comparing an aerial image produced by the CCD to a real processed wafer (paragraph 0047). It would have been obvious to one having ordinary skill in the art at the time of invention to perform such analysis techniques to determine an optimum focus of the lens module and optimum stage leveling of the exposure tool.

7. As to claims 5-6, Kochersperger in view of Lin discloses everything claimed, as applied to claim 2 above, however Kochersperger is silent with respect to a comparator coupled to the image scanner that compares the die image to the reference image, and an adjustment control coupled to the comparator that is adjusted based on an output of the comparator.

Lin discloses a comparator (Figure 1, element 26) coupled to the image scanner (Figure 1, element 20) that compares the die image to the reference image (paragraph 0042), and an adjustment control coupled to the comparator that is adjusted based on the output of the comparator (paragraph 0049). It would have been obvious to one having ordinary skill in the art at the time of invention to include these elements to determine and correct the distortions on the dynamic mask.

8. As to claim 7, it would be obvious to adjust the system at least once to insert a new substrate.

9. As to claim 14, the method would flow from the apparatus as set forth above.

10. As to claim 23, the method would flow from the apparatus as set forth above.

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11. As to claim 24, the method would flow from the apparatus as set forth above.

12. As to claim 25, the method would flow from the apparatus as set forth above. In addition Kochersperger discloses the reference reticle and the spatial light modulators are mounted on a movable surface (paragraph 0055), the tilting of said surfaces (paragraph (0057), and observing said images to determine the effects of the tilting (paragraph 0056) in order to correct for optical aberrations at the image plane. This motion encompasses the conventional definition of acquiring a desired telecentricity. Please see website ([http://www.mellesgriot.com/products/machinevision/lef\\_5.htm](http://www.mellesgriot.com/products/machinevision/lef_5.htm)).

Claims 8, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kochersperger in view of Lin in further view of Boettiger (U.S. Patent 6,794,100).

13. As to claim 8, Kochersperger in view of Lin discloses everything claimed, as applied above, with the exception of a shutter optically located between the illumination source and the reference reticle that controls the amount of illumination energy incident upon the reference reticle from the illumination source.

Boettiger discloses a shutter (Figure 1, element 140) optically located between the illumination source (Figure 1, element 120) and the reference reticle (Figure 1, element 131) that controls the amount of illumination energy incident upon the reference reticle from the illumination source. It would have been

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obvious to one having ordinary skill in the art at the time of invention to include a shutter to selectively tailor the intensity distribution to a selected level.

14. As to claim 15, the method would flow from the apparatus as set forth above.

***Allowable Subject Matter***

15. Claims 9-13, 16-22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: as to claims 9-13 the prior art of record, taken alone or in combination, fails to disclose or render obvious a reference reticle positioner that positions the reference reticle to direct incident illumination energy from the illumination source away from the pupil of the projection optics, in combination with the rest of the limitations of claim 1.

As to claims 16-22 the prior art of record, taken alone or in combination, fails to disclose or render obvious positioning the reference reticle to reflect incident illumination energy from the illumination source away from the pupil of the projection optics, in combination with the rest of the limitations of claim 14.

***Conclusion***

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bleeker et al. (U.S. Patent Application Publication 2004/0239908); Galburt et al (U.S. Patent 5,966,216); Sandstrom (U.S. Patent 6,833,854).

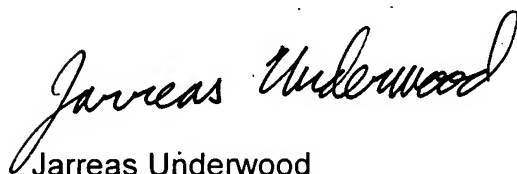


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jarreas C. Underwood whose telephone number is (575) 272-1536. The examiner can normally be reached on Monday-Friday 0800-1630.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley can be reached on (571) 272-2059. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jarreas Underwood  
Patent Examiner  
Art Unit 2877  
4/11/2006



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